



# CITY OF SAN DIEGO

PURCHASING DIVISION  
1200 Third Avenue, Suite 200  
San Diego, CA 92101-4195

Bid No. 6808-04-B

## REQUEST FOR BID

Bid Opening Date: May 27, 2004  
@ 2:30 p.m.

Subject: Furnish the City of San Diego with **RED AND GREEN LIGHT EMITTING DIODE SIGNAL MODULES**, as may be required for a period of one (1) year from date of award, with options to renew for four (4) additional one (1) year periods, in accordance with the attached specifications.

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Company _____	Name _____ [PRINT OR TYPE]
Federal Tax I.D. No. _____	Signature* _____
Street Address _____	Title _____
City _____	Date _____
State _____ Zip Code _____	
Tel. No. _____ Fax No. _____	<i>*Authorized Signature: The signer declares under penalty of perjury that she/he is authorized to sign this document and bind the company or organization to the terms of this agreement.</i>
E-Mail _____	

ONLY BIDS WITH AN ORIGINAL SIGNATURE  
WILL BE ACCEPTED.

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**This cover page must be completed and submitted as part of your bid.**

If your firm is not located in California, are you authorized to collect California sales tax? ☐ YES ☐ NO

If YES, under what Permit # \_\_\_\_\_

**NOTE: The City of San Diego is subject to State Sales and Use Tax, but is exempt from Federal Excise Tax and will furnish exemption certificates upon request. Do not include Federal Excise or Sales Tax in your Bid.**

If you are a Vendor located in the City of San Diego, a 1% sales tax refund to the City will be considered in evaluation of your bid.

Cash discount terms \_\_\_\_\_% \_\_\_\_\_ days.  
[Terms of less than 20 days will be considered as Net 30 for bid evaluation purposes.]

State delivery time required: \_\_\_\_\_ days after receipt of order.

The following addenda are acknowledged and incorporated in this submittal: \_\_\_\_\_

### FOR FURTHER INFORMATION CONCERNING THIS BID

**TERRELL D. BREAU/b19**, Procurement Specialist

Phone: (619) 533-4507 Facsimile: (619) 236-5904

E-mail: TBreaux@sandiego.gov

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**I. PRICING PAGE**

Item	Est. Qty.	U/M	Description	Manufacturer	Part No.	Unit Cost	Extension
1.	800	EA	12" Red Ball			\$	\$
2.	100	EA	8" Red Ball			\$	\$
3.	300	EA	12" Red Arrow			\$	\$
4.	800	EA	12" Green Ball			\$	\$
5.	400	EA	8" Green Ball			\$	\$
6.	300	EA	12" Green Arrow			\$	\$
<b>TOTAL:</b>							<b>\$</b>

## II. TERMS AND CONDITIONS

### A. AWARD

This bid will be awarded as a lot to the lowest responsive and responsible Bidder, or as may be in the best interest of the City.

### B. AWARD NOTIFICATION

The City will notify all Bidders, in writing, of its intent to award the bid.

### C. SUBMITTALS

#### 1. BID SUBMITTAL

Bids must be returned in a sealed envelope to the Purchasing Division, 1200 Third Avenue, Suite 200, San Diego, CA 92101. The bid number and opening date/time must be referenced on the outside of the envelope (lower left corner). Bids must be received by the Purchasing Reception Desk prior to bid opening at 2:30 p.m. on bid opening date. **Faxed bids will not be accepted.**

**The original and one (1) copy of bid, including any attachments, shall be submitted.**

#### 2. SUBMITTALS REQUIRED WITH BID

**Failure to provide the required submittals with the bid may be cause for the bid to be rejected as non-responsive.**

- a. Bidder's References (as specified in Section II, paragraph G).
- b. Samples (as specified in Section II, paragraph H).
- c. Certificate of Compliance (as specified in Section III, paragraph R).
- d. Warranty (as specified in Section III, paragraph S).
- e. Certification Survey (use form on page 24).

#### 3. SUBMITTALS REQUIRED UPON PROVISIONAL AWARD

**Failure to provide the following documentation within the time period specified may be cause for the provisional award to be voided and the bid to be rejected as non-responsive.**

- Taxpayer Identification Number (W-9) as specified in Section II, paragraph N, if not currently on file.

D. OPTION TO RENEW

The City may desire to exercise an option to renew the contract for four (4) additional one (1) year periods under the terms and conditions of the current contract beginning on the anniversary of the commencement of contract. The renewal is contingent on a mutual agreement between the City and the Contractor with such agreement to be confirmed sixty (60) days prior to the expiration of the contract period. Either the City or the Contractor may decline to confirm the renewal of the contract for any reason whatsoever, which shall render the renewal option null and void.

The City's initial letter offering the Bidder an opportunity to renew the contract does not constitute an award of the option period. Any option acceptance must be confirmed by the City, in writing, before it becomes valid.

If Bidder would accept the option to renew, please indicate the maximum percentage increase to which the prices in effect at the end of the current contract year would be subject if the renewal options were exercised. \_\_\_\_\_%

Failure to submit or complete the price increase section above will be construed to mean that prices bid will not be increased during any option period.

**If an increase is requested, the Contractor must provide detailed supporting documentation to justify the requested increase. The requested increase will be evaluated by the City, and the City reserves the right to accept or reject.**

Would the Bidder accept the option to renew, subject to the above stated conditions?

☐ YES      ☐ NO

Failure to submit or complete the above section will be construed to mean that Bidder is willing to accept the option to renew, subject to the stated conditions.

This section will not be considered in the evaluation for award.

The City may also desire to extend a contract on a month-to-month basis upon expiration of the current contract period under the terms and conditions of the current contract unless modified in writing. The renewal is contingent on a mutual agreement between the City and the Contractor with such agreement to be confirmed in writing prior to the expiration of the contract period.

E. PUBLIC AGENCY

It is intended that any other public agency as defined by Cal. Gov. Code § 6500 shall have the option to participate in any award made as a result of this solicitation. This option shall extend for the term of the agreement with the City of San Diego, and shall be subject to the Contractor's acceptance. Any participating public agency shall accept sole responsibility for the placing of orders, arranging for delivery and/or services, and making payments to the Contractor. The City of San Diego will not be liable, or responsible, for any obligations, including but not limited to financial responsibility, in connection with participation by other public agencies.

If other agencies participate, the Vendor shall furnish the City of San Diego an annual report showing the name of the agencies, contact person and phone number for each agency, and details of items supplied, including quantities. This report shall be furnished to the City on the anniversary date of the commencement of the contract.

F. QUANTITIES

The estimated requirements shown on the Pricing Page(s) will vary with the demands of the City of San Diego. These quantities are listed for information purposes only and shall not be deemed to either guarantee a minimum amount or restrict the maximum amount to be delivered throughout the contract period. Nor shall any variations from the estimated quantities, regardless of extent, entitle the Bidder to an adjustment in the unit price or to any other compensation.

G. REFERENCES/QUALIFICATIONS

Bidders are required to demonstrate successful performance for work of similar size and scope as specified in this contract during the past three (3) years. Bidders must also demonstrate that they are properly equipped to perform the work as specified in this contract.

**To enable the City to evaluate the responsibility, experience, skill, and business standing of the Bidder, the following documents must be included with the bid submittal:**

- Bidder's References (use form on page 23).

H. SAMPLES

One (1) sample of each item shall be submitted on or before bid opening date to the address below. Failure to submit samples shall be grounds for rejections of bid. All samples should be labeled with Bidder's name and bid number.

City of San Diego/Electrical Division  
Attn: Dan Roberts  
2781 Caminito Chollas  
San Diego, CA 92105-5039

I. PRICING

Prices bid shall include all freight and delivery charges and shall be FOB Destination to:

City of San Diego/Street Division  
2781 Caminito Chollas  
San Diego, CA 92105-5039

J. GENERAL PROVISIONS

Except as otherwise specified herein, the City of San Diego General Provisions, dated September 12, 2001, (on file in the Office of the Purchasing Agent) are incorporated as part of this bid/proposal and any resulting contract by reference. The General Provisions are available online at [www.sandiego.gov/purchasing](http://www.sandiego.gov/purchasing) or via request from the Purchasing Division by calling (619) 236-6000.

By signing and/or authorizing the bid submittal, the Bidder/Proposer acknowledges that they have read and understood the meaning, intent and requirements of said General Provisions; and acknowledge said General Provisions are included as a part of this bid/proposal.

In the event of any conflict between the City of San Diego General Provisions and the terms and conditions included in this bid/proposal, the terms and conditions of this bid/proposal shall prevail.

K. ADDENDA

It is the Bidders' responsibility to ensure that all addenda issued are incorporated in their bid submittal.

Failure to acknowledge and incorporate addenda will not relieve the Bidder of the responsibility to meet all terms and conditions of the specifications for price bid.

L. EXCEPTIONS

If a Bidder/Proposer takes any exception to any part of these specifications as written, or as amended by any Addenda subsequently issued, or the General Provisions, they must do so in writing. Said exceptions must be submitted with the bid/proposal. Failure to do so will be construed as acceptance of all provisions of the specifications and General Provisions.



M. BID RESULTS

Bid results **will not** be given out over the phone. To obtain bid results, either (1) attend the bid opening or (2) provide a self-addressed stamped envelope referencing the bid number. Envelopes may be submitted with the bid, or mailed directly to the Purchasing Division. They will be kept on file until the bid opens and the extensions are verified. Bid tabulations will generally be mailed to requester within **three (3) working days** after the bid opening to review bid tabulation.

N. REQUEST FOR TAXPAYER IDENTIFICATION NUMBER

I.R.S. regulations require the City of San Diego to have the correct name, address, and Taxpayer Identification Number (TIN) or Social Security Number (SSN) on file for businesses or persons who provide services or products to the City of San Diego. This information is necessary to complete Form 1099 at the end of each tax year.

In order to comply with I.R.S. regulations, the City of San Diego requires each Vendor to provide a Form W-9 prior to award of contract. Failure to provide a completed Form W-9 within three (3) business days of the City's request may result in a bid being declared non-responsive and rejected.

O. AUDIT AND INSPECTION OF RECORDS

The Contractor, and any Subcontractors, shall make available upon request all records which in the opinion of the City Auditor are necessary to conduct an audit of this contract. Such records may include invoices, materials, payrolls, personnel records, and other data relating to all matters covered by this contract. The Contractor and Subcontractors shall retain such data and records for a period of not less than three (3) years following receipt of final payment. The Contractor shall make available all requested data and records at reasonable locations within the City or County of San Diego, at any time during normal business hours, and as often as the City deems necessary. If records are not made available within the City or County of San Diego, the Contractor shall pay the City's travel costs to the location where the records are maintained. Failure to make requested records available for audit by the date requested will result in immediate termination of contract.

P. ASSIGNMENT OF CONTRACT

Contractor shall not assign this contract, or any right or interest hereunder, without prior written consent of the City.

Q. DRUG-FREE WORKPLACE POLICY

All City projects are subject to City of San Diego Council Policy No. 100-17, Drug-Free Workplace. This policy requires that all City construction contractors, consultants, grantees, and providers of non-professional services provide a drug-free workplace in accordance with the provisions contained therein.

The Drug-Free Workplace Policy is available online at [www.sandiego.gov/purchasing](http://www.sandiego.gov/purchasing) or via request from the Purchasing Division by calling (619) 236-6000.

By signing and/or authorizing the bid submittal, the Bidder/Proposer acknowledges that they have read and understood the meaning, intent, and requirements of said policy; acknowledge said policy is incorporated as part of this bid/proposal; certify that they have a drug-free workplace program in place that complies with said policy; and that Subcontractor agreements for this bid/proposal contain language which indicates the Subcontractor's agreement to comply with this policy.

R. AMERICANS WITH DISABILITIES ACT

Every person or organization awarded a contract, lease, or grant by the City of San Diego acknowledges and agrees that they are aware of and will comply with Council Policy 100-04, adopted by Resolution No. 282153 relating to the federally mandated Americans with Disabilities Act (ADA). Contractors and Subcontractors will be individually responsible for their own ADA program.

In compliance with Council Policy 000-03, adopted by Resolution No. 279130, sign language or oral interpreting services are available at pre-bid meetings and bid openings with a five (5) business day notice to Purchasing at (619) 236-6000 or email at [Purchasing@sandiego.gov](mailto:Purchasing@sandiego.gov).

S. EQUAL EMPLOYMENT OPPORTUNITY

Contractor shall not discriminate against any employee or applicant for employment on any basis prohibited by law. Contractor shall provide equal opportunity in all employment practices. Contractor shall also ensure that their Subcontractors comply with the City's Equal Employment Opportunity Program. Contractor agrees to be bound by the City Of San Diego Equal Opportunity Ordinance (Municipal Code Chapter II, Article 2, Division 27).

Contractor shall submit a Work Force Report or an Equal Employment Opportunity Plan, within five (5) days of being notified by the Purchasing Division.

For questions regarding the City's Equal Employment Opportunity Program, contact the Equal Opportunity Contracting Office at (619) 533-4464.

T. NONDISCRIMINATION IN CONTRACTING

Contractor shall not discriminate on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability in the solicitation, selection, hiring or treatment of Subcontractors, Vendors or Suppliers. Contractor shall provide equal opportunity for Subcontractors to participate in subcontracting opportunities. Contractor understands and agrees that violation of this clause shall be considered a material breach of the contract and may result in contract termination, debarment, or other sanctions. This language shall also be included in construction contracts between the Contractor and any Subcontractors, Vendors, and Suppliers.

As part of its bid proposal, Bidder shall provide to the City a list of all instances within the past ten (10) years where a complaint was filed or pending against Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, Subcontractors, Vendors, or Suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.

Upon the City's request, Contractor agrees to provide to the City, within sixty (60) calendar days, a truthful and complete list of names of all Subcontractors, Vendors, and Suppliers that Contractor has used in the past five (5) years on any of its contracts that were undertaken within San Diego County, including the total dollar amount paid by Contractor for each subcontract or supply contract. Contractor further agrees to fully cooperate in any investigation conducted by the City pursuant to the City's Nondiscrimination in Contracting Ordinance (Municipal Code Sections 22.3401 - 22.3417). Contractor understands and agrees that violation of this clause shall be considered a material breach of the contract and may result in remedies being ordered against the Contractor up to and including contract termination, debarment, and other sanctions for violation of the provisions of the Nondiscrimination in Contracting Ordinance. Contractor further understands and agrees that the procedures, remedies, and sanctions provided for in the Nondiscrimination Ordinance apply only to violations of said Nondiscrimination Ordinance.

For questions regarding the City's Nondiscrimination in Contracting Ordinance, contact the Equal Opportunity Contracting Office at (619) 533-4464.

### **III. SPECIFICATIONS**

#### **A. DEFINITION**

For all traffic signals faces on this project, the 12" sections, the 8" sections, and arrow sections shall utilize light emitting diode signal modules.

Each light emitting diode (LED) signal module shall consist of an assembly that utilizes light emitting diodes as the light source in lieu of an incandescent lamp for use in traffic signal sections.

#### **B. GENERAL**

1. Only those units on the "Cal Trans Qualified Products List" will be considered as acceptable.
2. Each Type 1 LED signal module shall be designed to be installed in the doorframe of a standard traffic signal housing. The lamp socket, reflector, reflector holder, and lens used with an incandescent lamp shall not be used in a signal section in which a Type 1 LED signal module is installed.
3. LED signal modules provided under this contract shall be from the same Manufacturer, and each size shall be the same model.
4. Each Type 1 LED signal module shall be a sealed unit with two (2) conductors (color coded) for connecting to power, a printed circuit board, power supply, a lens and gasket, and shall be weather proof after installation and connection. The circuit board and power supply shall be contained inside the module. Circuit boards shall conform to Chapter 1, Section 6 of the "Transportation Electrical Equipment Specifications".
5. Conductors for Type 1 modules shall be 39" in length, with quick disconnect terminals attached and shall conform to Section 86-4.01C, "Electrical Components", of the Cal Trans Standard Specifications.
6. The lens of the Type 1 module shall be integral to the unit, shall be convex with a smooth outer surface and made of ultraviolet stabilized plastic or of glass. The lens shall be capable of withstanding ultraviolet (direct sunlight) exposure for a minimum period of five (5) years without exhibiting evidence of deterioration.
7. The Type 1 module shall be sealed in the doorframe with a one (1) piece EPDM (ethylene propylene rubber) gasket.

8. The LEDs utilized in the modules shall be Aluminum Indium Gallium Phosphide (AlInGaP) technology for red indication and Gallium Nitride (GaN) technology for green indications, and shall be the ultra bright type rated for 100,000 hours of continuous operation from -40°C to +74°C.
9. The individual LEDs shall be wired such that a catastrophic failure of one (1) LED will result in the loss of not more than 1 percent (1%) of the signal module light output.

C. PHYSICAL AND MECHANICAL REQUIREMENTS

LED traffic signal modules shall be designed as retrofit replacements for existing optical units of signal lamps and shall not require special tools for installation. LED signal modules shall fit into existing traffic signal section housings without any modification to the housing.

Installation of a LED signal module shall only require the removal of the optical unit components, i.e., lens, lamp module, gaskets, and reflector; shall be weather tight and fit securely in the housing; and shall connect directly to electrical wiring.

The arrow modules shall meet or exceed specifications stated in Section 9.01 of the ITE Publication: Equipment and Materials Standards, Chapter 2 (Vehicle Traffic Control Signal Heads) for arrow indications. The LEDs shall be spread evenly across the illuminated portion of the arrow area.

D. LED SIGNAL MODULE LENS

The LED signal module shall be capable of replacing the optical unit. The lens may be tinted or may use transparent film or materials with similar characteristics to enhance ON/OFF contrasts. The use of tinting or other materials to enhance ON/OFF contrasts shall not affect chromaticity and shall be uniform across the face of the lens.

If a polymeric lens is used, a surface coating or chemical surface treatment shall be used to provide front surface abrasion resistance.

E. ENVIRONMENTAL REQUIREMENTS

The LED signal module shall be rated for use in the operating temperature range of -40°C (-40°F) to +74°C (+165°F).

The LED signal module shall be protected against dust and moisture intrusion per the requirements of NEMA Standard 250-1991 for Type 4 enclosures to protect all internal components.

The LED signal module lens shall be UV stabilized and shall be capable of withstanding ultraviolet (direct sunlight) exposure for a minimum period of sixty (60) months without exhibiting evidence of deterioration.

F. CONSTRUCTION

The LED signal module shall be a single, self-contained device, not requiring on-site assembly for installation into an existing traffic signal housing. The power supply for the LED signal module shall be integral to the unit.

The assembly and manufacturing process for the LED signal assembly shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration from high winds and other sources.

G. MATERIALS

Material used for the lens and signal module construction shall conform to ASTM specifications, where applicable.

Enclosures containing either the power supply or electronic components of the signal module shall be made of UL94VO flame retardant materials. The lens of the signal module is excluded from this requirement.

H. MODULE IDENTIFICATION

Each LED signal module shall have the Manufacturer's name, trademark, and other necessary identification permanently marked on the back of the module. Each individual LED signal module shall be identified with serial number for warranty purposes.

The following operating characteristics shall be identified: rated voltage, power consumption, and volt-ampere.

Each Type 1 LED signal modules shall have prominent and permanent vertical marking(s) for correct indexing and orientation within a signal housing. The markings shall consist of an up arrow, or the word "UP" or "TOP".

I. PHOTOMETRIC REQUIREMENTS

The minimum initial luminous intensity values for the modules shall be as stated in Table 2-2 and Table 2-4 (as specified in Section III, paragraph T) at 25°C.

The modules shall meet or exceed the illumination values as shown in Table 2-3 and Table 2-5, (as specified in Section III, paragraph T) throughout the useful life based on normal use in a traffic signal operation over the operating temperature range.

Yellow modules shall meet or exceed the luminous intensity values as shown in Table 2-3 and/or Table 2-5, (as specified in Section III, paragraph T) throughout the useful life based on normal use in a traffic signal operation at 25°C.

The measured chromaticity coordinates of the modules shall conform to the chromaticity requirements of Table 2-6, (as specified in Section III, paragraph T) throughout the useful life over the operating temperature range.

The LED signal modules tested or submitted for testing shall be representative of typical average production units. Circular modules shall be tested according to California Test No. 604. All optical testing shall be performed with the module mounted in a standard traffic signal section but without a visor or hood attached to the signal section.

The LEDs shall be spread evenly across the illuminated portion of the arrow area. Arrow modules shall be tested according to California Test No. 3001. All optical testing shall be performed with the module mounted in a standard traffic signal section but without a visor or hood attached to the signal section. Each LED arrow signal section indication shall provide a minimum average luminous intensity as listed in Table 2-4. All measurements shall be performed at rated operating voltage of 120 VAC.

#### J. ELECTRICAL

Maximum power consumption requirements for LED signal modules shall be as listed in Table 2-1 (as specified in Section III, paragraph T).

LED signal modules shall operate from a  $60\text{hz} \pm 3\text{hz}$  AC line over a voltage ranging from 80 volts to 135 volts. The LED circuitry shall prevent perceptible flicker over the voltage range specified above. The fluctuations of line voltage shall have no visible effect on the luminous intensity of the indications. Rated voltage for all measurements shall be 120 volts.

All wiring and terminal blocks shall meet the requirements of Section 13.02 of the ITE Publication: Equipment and Materials Standards, Chapter 2 (VTCSH). Two (2) secured, color coded, 36" long 600V, 20 AWG minimum, jacketed wires, conforming to the National Electric Code, rated for service at  $+105^{\circ}\text{C}$ , are to be provided for electrical connection for each Type 1 LED module.

The signal module on-board circuitry shall include voltage surge protection to withstand high-repetition noise transients as stated in Section 2.1.6 of NEMA Standard TS-2, 1992.

LED signal modules shall be operationally compatible with currently used controller assemblies (solid state load switches, flashers, and conflict monitors). When a current of 20 ma AC (or less) is applied to the unit, the voltage read across the two (2) leads shall be 15 VAC or less.

LED signal modules and associated on-board circuitry must meet Federal Communications Commission (FCC) Title 47, SubPart B, Section 15 regulations concerning the emission of electronic noise.

The LED signal module shall provide a power factor of 0.90 or greater.

Total harmonic distortion (current and voltage) induced into an AC power line by an LED signal module shall not exceed twenty percent (20%).

K. QUALITY ASSURANCE

LED signal modules shall be manufactured in accordance with a vendor quality assurance (QA) program. The QA program shall include two (2) types of quality assurance: (1) design quality assurance and (2) production quality assurance.

LED signal module designs not satisfying design qualification testing and the production quality assurance testing performance requirements described below shall not be labeled, advertised, or sold as conforming to this specification.

L. PRODUCTION QUALITY ASSURANCE TESTING

The following Production Quality Assurance tests shall be performed on each new LED signal module prior to shipment. Failure to meet requirements of any of these tests shall be cause for rejection. The Manufacturer for warranty purposes shall retain test results for seven (7) years.

Each LED signal module shall be tested for rated initial intensity after burn-in. Burn-in period shall consist of each signal module being energized at rated voltage for a thirty (30) minute stabilization period before the measurement is made. A single point measurement with a correlation to the intensity requirements of Table 2-2 for circular modules may be used. The ambient temperature for this measurement shall be +25°C (+77°F).

Each LED signal module not meeting minimum luminous intensity requirements per Table 2-2 or Table 2-4 shall be a cause for rejection.

All LED signal module shall be tested for required power factor after burn-in.

Each LED signal module shall be measured for current flow in amperes after burn-in. The measured current values shall be compared against current values resulting from design qualification measurements under "Design Qualification Testing". The current flow shall not exceed the rated value. The measured ampere values with rated voltage shall be recorded as volt-ampere (VA) on the product labels.

Each LED signal module shall be visually inspected for any exterior physical damage or assembly anomalies. Careful attention shall be paid to the surface of the lens to ensure there are no scratches (abrasions), cracks, chips, discoloration, or other defects. Any such defects shall be cause for rejection.



M. MANUFACTURER'S SERIAL NUMBERS

Identification of the component and sub-assembly level may be required if the reliability and performance of the module must be traceable to the original item Manufacturers of the module components and subassemblies.

N. DESIGN QUALIFICATION TESTING

Design qualification testing shall be performed on new LED signal module designs, and when a major design change has been implemented on an existing design. The minimum sample quantity of LED signal modules shall be as stated for each test. Failure to meet requirements for any of these tests shall be cause for rejection.

A random sample of six (6) LED signal modules from the production line shall be energized for a minimum of twenty-four hours (24), at one hundred percent (100%) on-time duty cycle, in a temperature of 75°C (+165°F) before performing any design qualification testing. Any failure within an LED signal module after burn-in shall be cause for rejection.

O. RATED INITIAL LUMINOUS INTENSITY

After burn-in, a sample of six (6) LED signal modules from the production batch shall be tested for rate initial intensity per the requirements of "Photometric Requirements". Before measurement, each LED signal module shall be energized at rated voltage, with one hundred percent (100%) on-time duty cycle, for a time period of thirty (30) minutes.

The ambient temperature for this measurement shall be 25°C (77°F). The test results for this test shall have recorded the current voltage, total harmonic distortion (THD), and power factor (PF) associated with each measurement.

P. CHROMATICITY (COLOR)

A sample of two (2) LED signal modules from the production batch shall be measured for chromaticity (color) per the requirements of "Chromaticity" requirements under "Photometric Requirements" (as specified in Section III, paragraph I). A spectra radiometer shall be used for this measurement. The ambient temperature for this measurement shall be 25°C (77°F).

Q. ELECTRICAL

A sample of six (6) LED signal modules from the production batch shall be measured for current flow in amperes. The measured current values shall be used for quality comparison of Production Quality Assurance current measurement on production modules.

A sample of six (6) LED signal modules from the production batch shall be measured for power factor. A commercially available power factor meter may be used to perform this measurement.

A sample of six (6) LED modules from the production batch shall be measured for total harmonic distortion. A commercially available total harmonic distortion meter may be used to perform this measurement.

A sample of six (6) LED signal modules from the production batch shall be tested per the requirements of “Electrical”, with reference to Class A emission limits referenced in Federal Communications Commission (FCC) Title 47, SubPart B, Section 15.

A sample of six (6) LED signal modules from the production batch shall be tested for compatibility with the controller unit, conflict monitor, and load switch. Each signal module shall be connected to any AC voltage supply between the values of 80 and 135 VAC. The AC voltage developed across each LED signal module so connected shall not exceed 10 volts RMS as the input AC voltage is varied from 80 volts to 135 volts RMS.

A sample of six (6) LED modules from the production batch shall be tested for transient immunity per “Electrical” using the procedure described in NEMA Standard TS-1992.

Mechanical vibration testing shall be performed on a sample of three (3) LED signal modules per MIL-STD-883, Test Method 2007, using three (3) four (4) minute cycles along each x, y, and z axis, at a force of 2.5 Gs, with a frequency sweep from 2 Hz to 120 Hz. The loosening of the lens, of any internal components, or other physical damage shall be cause for rejection.

Temperature cycling shall be performed on a sample of three (3) LED signal modules per MIL-STD-833, Test Method 1010. The temperature range shall be per “Environmental Requirements”. A minimum of twenty (20) cycles shall be performed with a thirty (30) minute transfer time between temperature extremes and a thirty (30) minute dwell time at each temperature. Signal under test shall be non-operating. Failure of a module to function properly or any evidence of cracking of the module lens or housing after temperature cycling shall be cause for rejection.

Moisture resistance testing shall be performed on a sample of three (3) LED signal modules per NEMA Standard 250-1991 for Type 4 enclosures. Any evidence of internal moisture after testing shall be cause for rejection.

R. CERTIFICATE OF COMPLIANCE

The Contractor shall provide the Engineer a Certificate of Compliance with each order from the Manufacturer in accordance with the provisions of Section 6-1.07, "Certificates of Compliance", of the Standard Specifications. The certificate shall also include a copy of all applicable test reports on the LED signal modules.

S. WARRANTY

The Manufacturer shall provide a written warranty against defects in materials and workmanship for the LED signal modules for a period of sixty (60) months after installation of the modules. A copy of the Warranty is to be included with the bid. All warranty documentation shall be given to the Engineer prior to installation.

T. WARRANTY REPLACEMENT

The replacement modules shall be delivered to Street Division Electrical Shop within five (5) working days after notification.

City of San Diego  
Street Division/Electrical Shop  
2781 Caminito Centro  
San Diego, CA 92105-5039

The failed modules will be picked up at the above address at the same time as the replacement is delivered.

U. TABLES

1. Table 2-1 Maximum Power Consumption (In Watts)

	<b>Red</b>		<b>Yellow</b>		<b>Green</b>	
<b>Temperature</b>	25°C	74°C	25°C	74°C	25°C	74°C
<b>300 mm Circular</b>	12	17	22	25	15	15
<b>200 mm Circular</b>	8	13	13	16	12	12
<b>300 mm Arrow</b>	9	12	10	12	11	11

2. Table 2-2 Minimum Initial Intensities for Circular Indications (In cd)

		200 mm			300 mm	
Angle (v,h)	Red	Yellow	Green	Red	Yellow	Green
2.5, ± 2.5	157	314	314	399	798	798
2.5, ± 7.5	114	228	228	295	589	589
2.5, ± 12.5	67	133	133	166	333	333
2.5, ± 17.5	29	57	57	90	181	181
7.5, ± 2.5	119	238	238	266	532	532
7.5, ± 7.5	105	209	209	238	475	475
7.5, ± 12.5	76	152	152	171	342	342
7.5, ± 17.5	48	95	95	105	209	209
7.5, ± 22.5	21	43	43	45	90	90
7.5, ± 27.5	12	24	24	19	38	38
12.5, ± 2.5	43	86	86	59	119	119
12.5, ± 7.5	38	76	76	57	114	114
12.5, ± 12.5	33	67	67	52	105	105
12.5, ± 17.5	24	48	48	40	81	81
12.5, ± 22.5	14	29	29	26	52	52
12.5, ± 27.5	10	19	19	19	38	38
17.5, ± 2.5	19	38	38	26	52	52
17.5, ± 7.5	17	33	33	26	52	52
17.5, ± 12.5	12	24	24	26	52	52
17.5, ± 17.5	10	19	19	26	52	52
17.5, ± 22.5	7	14	14	24	48	48
17.5, ± 27.5	5	10	10	19	38	38

3. Table 2-3 Maintained Minimum Intensities for Circular Indications (In cd)

		<b>200 mm</b>		<b>300 mm</b>		
<b>Angle (v,h)</b>	<b>Red</b>	<b>Yellow</b>	<b>Green</b>	<b>Red</b>	<b>Yellow</b>	<b>Green</b>
2.5, ± 2.5	133	267	267	339	678	678
2.5, ± 7.5	97	194	194	251	501	501
2.5, ± 12.5	57	113	113	141	283	283
2.5, ± 17.5	25	48	48	77	154	154
7.5, ± 2.5	101	202	202	226	452	452
7.5, ± 7.5	89	178	178	202	404	404
7.5, ± 12.5	65	129	129	145	291	291
7.5, ± 17.5	41	81	81	89	178	178
7.5, ± 22.5	18	37	37	38	77	77
7.5, ± 27.5	10	20	20	16	32	32
12.5, ± 2.5	37	73	73	50	101	101
12.5, ± 7.5	32	65	65	48	97	97
12.5, ± 12.5	28	57	57	44	89	89
12.5, ± 17.5	20	41	41	34	69	69
12.5, ± 22.5	12	25	25	22	44	44
12.5, ± 27.5	9	16	16	16	32	32
17.5, ± 2.5	16	32	32	22	44	44
17.5, ± 7.5	14	28	28	22	44	44
17.5, ± 12.5	10	20	20	22	44	44
17.5, ± 17.5	9	16	16	22	44	44
17.5, ± 22.5	6	12	12	20	41	41
17.5, ± 27.5	4	9	9	16	32	32

4. Table 2-4 Minimum Initial Intensities for Arrow Indications (In cd/m<sup>2</sup>)

	<b>Red</b>	<b>Yellow</b>	<b>Green</b>
<b>Arrow Indication</b>	5,500	11,000	11,000

5. Table 2-5 Minimum Maintained Intensities for Arrow Indications (In cd/m<sup>2</sup>)

	<b>Red</b>	<b>Yellow</b>	<b>Green</b>
<b>Arrow Indication</b>	5,500	11,000	11,000

6. Table 2-6 Chromaticity Standards (CIE Chart)

a. Section 8.04 of

<b>Red</b>	<b>Y:</b> not greater than 0.308, or less than 0.998 – x
<b>Yellow</b>	<b>Y:</b> not less than 0.411, nor less than 0.995 - x, nor less than 0.452
<b>Green</b>	<b>Y:</b> Not less than 0.506 – 0.519x, nor less than 0.150 + 1.068x, nor more than 0.730 - x

### BIDDER'S REFERENCES

The Bidder is **required** to provide a minimum of three (3) references where work of a similar size and nature was performed within the past three (3) years. This will enable the City of San Diego to judge the responsibility, experience, skill, and business standing of the Bidder.

#### REFERENCES

Company Name: \_\_\_\_\_ Contact Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

\_\_\_\_\_ Fax Number: \_\_\_\_\_

Dollar Value of Contract: \$ \_\_\_\_\_ Contract Dates: \_\_\_\_\_

Requirements of Contract: \_\_\_\_\_

\_\_\_\_\_

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Company Name: \_\_\_\_\_ Contact Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

\_\_\_\_\_ Fax Number: \_\_\_\_\_

Dollar Value of Contract: \$ \_\_\_\_\_ Contract Dates: \_\_\_\_\_

Requirements of Contract: \_\_\_\_\_

\_\_\_\_\_

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Company Name: \_\_\_\_\_ Contact Name: \_\_\_\_\_

Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

\_\_\_\_\_ Fax Number: \_\_\_\_\_

Dollar Value of Contract: \$ \_\_\_\_\_ Contract Dates: \_\_\_\_\_

Requirements of Contract: \_\_\_\_\_

\_\_\_\_\_

## Certification Survey

For Small, Ethnically and Culturally Diverse,  
Woman, Disadvantaged, Disabled Veteran, Or Other Businesses

All Contractors are required to complete this form and return it with their bid package.

Company Name: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

Telephone No.: (\_\_\_\_\_) \_\_\_\_\_

E-Mail Address: \_\_\_\_\_

1. Contractor's company is **currently** certified as small, ethnically and culturally diverse, woman, disadvantaged, disabled veteran, or other business? ☐ Yes ☐ No

Certification Number/Agency: \_\_\_\_\_

2. Contractor's company has applied for certification? ☐ Yes ☐ No

If yes, which agency? \_\_\_\_\_

3. Contractor's company is an independently owned business? ☐ Yes ☐ No

4. Contractor's company is 51% or more owned by a socially, economically, disadvantaged individual\*? ☐ Yes ☐ No

5. SIC Code: \_\_\_\_\_ NAICS: \_\_\_\_\_

6. Number of Employees: \_\_\_\_\_

7. Annual Gross Receipts (three year average): \_\_\_\_\_

8. This is not an application for certification. If you would like to receive an application for certification, please check box: ☐

I certify that this information is correct: \_\_\_\_\_

Authorized Signature

(Date)

\* Black Americans, Native Americans, Hispanic Americans, Asian-Pacific Americans, Subcontinent Asian Americans, Women, any additional groups whose members are designated as socially and economically disadvantaged by the Small Business Administration (SBA) at such time as the SBA designation becomes effective.